CHAPTER 4

BRIDGE FILES

4.01 Purpose

The National Bridge Inspection Standards (NBIS) require bridge owners to maintain comprehensive current records of each bridge in their inventory. The information pertaining to each bridge must be readily available for the bridge inspector, bridge owner, bridge program manager, or FHWA to review and must be maintained throughout the life of the structure. Michigan has a decentralized bridge inspection program and delegates inspection responsibilities to the regions and local agencies throughout the state. However, for MDOT owned bridges many of the technical aspects, such as program management and load rating are performed at the central office for improved alignment and accuracy. Local agency bridge owners are responsible to perform inspections with qualified staff or secure a qualified consultant to provide the inspections, including any technical services required if they do not have qualified staff, and collect the data for each bridge. This chapter describes MDOT's policy of bridge file record keeping as it applies to both state and local agency bridges.

4.02 Responsibilities

Each bridge owner is required to keep a minimum of three types of bridge files. The bridge owner's quality control procedures and findings must be stored in a separate. If the bridge owner delegates the quality control activities to a consultant they must maintain a copy of the consultant's quality control procedures. A second file is essential to record the qualifications of the personnel performing the inspections or load ratings. Separating these two files will aid efficiency during internal quality control, MDOT quality assurance, and FHWA bridge inspection program reviews.

A third file is to be maintained for each bridge under jurisdiction of the bridge owner. The bridge file should contain the necessary components that are identified in Section 2 of the AASHTO *Manual for Bridge Evaluation* (MBE). At a minimum, the bridge file must contain current records of all that apply:

- Plan Drawings
- Photos
- Bridge Safety Inspection Report
- Structure Inventory & Appraisal
- Load Rating documentation
- Channel Cross Sections
- Scour Assessment and Plan of Action
- Flood Data and Waterway Adequacy
- Significant Correspondence
- Critical Findings

MDOT regions and local agencies must work diligently to maintain and store all pertinent bridge information, such as original construction documents, work history, photos, and other pertinent data so it may be evaluated when needed. Due to the large network of MDOT owned bridges and specialized technical units assisting in their evaluation, particular information about each bridge is located in their respective area. Although all of the information for every bridge may not be in one physical file, it must be readily available for the bridge inspector. Since local agencies are responsible for less inventory they are required to store all of their bridge file information in one central location.

Region and local agency bridge owners are required to utilize the MiB^{RIDG}E web based application as they work to effectively improve public safety, manage infrastructure assets, and retain inventory data. Specifically, the MiB^{RIDG}E web application allows the user to review and update SI&A coding, inspection reports, load rating information, scour action plans, and work recommendations,.

4.03 Inspection Reports

Although MiB^{RIDG}E retains historical condition data throughout the entire life of the bridge in a central database that allows efficient review and reporting to the FHWA, a copy of each inspection report must be saved separately from the database. The bridge owner may retain an electronic copy in portable document format (.pdf), or print a hardcopy and place it in the bridge file. All of the following types of inspection reports shall be retained as applicable for each bridge:

- Bridge Safety Inspection Report
- Culvert Safety Inspection Report
- Fracture Critical Safety Inspection Report
- Fatigue Sensitive Inspection Report
- Bridge Diving Inspection Report
- Other Special Inspection Report
- Damage Inspection Report

4.04 Construction and Maintenance Documents

For MDOT bridges, the plans and specifications used to construct or rehabilitate a bridge are located at the TSC that administered the project until the Financial Operations Division final accounting date. Afterward, the information is stored at the Michigan Department of History, Arts, and Libraries and accessible by contacting the MDOT's Records Management Coordinator. Due to the space requirements for construction files it is impractical to house them with each bridge owner. As built drawings for MDOT owned bridges, including any modifications to a bridge initiated under contract, are located in the ProjectWise database. Important structural details such as fatigue prone details should be included in the paper or electronic bridge file. The bridge owner is required to understand where the information is located in the database. Local agencies are required to retain all bridge records in the file. Plans for each structure may be stored electronically, a copy of the disc or other storage media may be kept with the

inspection reports, but a backup copy off site is suggested. In the event that plans do not exist the agency must prepare sketches that includes general characteristics and dimensions for the structure with detailed information provided for load path members.

For MDOT Bridges, the documents available at the Records Management Office encompass pertinent information that was collected during the construction stage which includes:

- Concrete mix designs, test results, and quality control plan
- Tested stock reports
- Pile charts provided by the Geotechnical Section
- Contract work orders initiated by the Construction Engineer
- Shop inspection of structural steel
- Structure foundation inspection
- Coating information and federal color documentation
- As-built files documenting changes to the original contract drawings

The information is organized according to the construction project records list and retained as specified in Bureau of Highway Instructional Memorandum 2008-09. MDOT is beginning to store all construction documentation in the ProjectWise database which will aid organization, improve access, and assist the bridge inspector during future inspections.

General and specific routine and preventive maintenance actions are to be collected by each bridge owner to varying degrees of detail. MDOT is developing a bridge maintenance manual that will provide additional instruction and alignment for collecting the data. In the future, the MiB^{RIDG}E application will be modified to collect maintenance activities such as the work performed, materials utilized, and effort expended. Until the process is effective bridge owners should continue to track maintenance activities for each bridge, and be able to report the work during quality assurance reviews.

4.05 Significant Correspondence

All important correspondence since the inventory inspection is to be retained in the bridge file. The bridge inspector must have access to relevant correspondence to aid the inspection and understand any previous concerns so they may be reviewed in the field. At a minimum, correspondence should be included anytime there are requests for:

- Structural Capacity Evaluations (Load Rating)
- Critical Findings
- Emergency Repairs
- Other Special Inspections
- Damage Inspections
- In-Depth Inspections
- Structural Monitoring
- Scour Evaluation

- Non-Critical Requests For Action
- Maintenance Work Requests

4.06 Photographs

The photographs recorded during an inspection are to be stored in the bridge file or electronically. A description must be provided beneath each hardcopy photo, or a photo log must be included in the electronic file. Photographs allow those unfamiliar with a structure to determine the rate of deterioration and any follow-up maintenance actions that may be needed. Each bridge file must contain photographs that include:

- A transverse view of the deck
- An elevation that includes any under clearance signs fastened to the fascia
- Any utilities that are attached to the structure
- Deterioration of structural and safety elements.
- Any load posting signs

4.07 Accident Records

For MDOT owned bridges, inspections that resulted in measurable damage to a bridge that occurred prior to 1994 are stored at the Operations Field Services office formerly known as Central Maintenance. Bridge Field Services continues to maintain records of high load hit data and other damage inspections on a statewide basis for each bridge that was either reported by the bridge owner or law enforcement. Local agency bridge owners are required to compile all accident data in their bridge files. The bridge owner must maintain information collected from an accident that damaged a bridge which includes the following:

- Crash Report
- Completed Request For Action
- High Load Hit or Other Special Inspection Report
- Costs For Any Necessary Repairs

4.08 Rating Records, Posting, and Permit Loads

The bridge inspector is responsible for verifying if the bridge must be posted and the required load posting by reviewing load rating calculations and Items 41 and 141 during each inspection. The Bridge Management Section is responsible for performing the load rating and retaining the data of MDOT owned bridges. The MDOT Commercial Vehicle Transport Section issues permits for oversize and/or overweight vehicles on federal and state roadways.

The local agency bridge owner is responsible for assigning the load rating and ensuring the information is in the bridge file. When a consultant is hired to perform the load rating the bridge owner shall verify that the bridge analysis assumption and summary forms are complete and retain copies of all data used for the rating on a file storage device in their jurisdiction. Each county or city is responsible for issuing

overweight permits on local streets. The results of the load rating are provided to the bridge owner who is responsible for entering the corresponding SI&A item values into MiB[RIDG]E. For MDOT Structures, the Bridge Management Section will retain all of the information used by the load rating engineer including:

- Bridge Analysis Assumption Form
- Bridge Analysis Summary Form
- Calculations
- Computer Files
- Any additional information necessary to perform the rating

4.09 Waterway Data

All bridges over water require a level one scour analysis, and may require a level two or three according to the scour susceptibility of the foundations. For MDOT structures, the Hydraulics Section prepares the worksheets in Appendix 6 of the Drainage Manual and retains the information. Local agency bridge owners must perform the analysis or secure a consultant to provide the information and ensure the results are in the bridge file. The bridge owner is also responsible for accurate coding of Item 113 and developing a complete plan of action for all scour critical bridges that is recorded in the bridge file. Stream bed cross-sections shall be recorded at the minimum rate specified in the MDOT *Guidelines for Bridge Inspection Frequencies* for all MDOT owned and scour critical local agency owned bridges. For local agency owned bridges that are not scour critical a minimum of one cross-section shall be in the file and additional measurements shall be recorded as-needed through applied engineering judgment.

4.10 Traffic Data

For MDOT Bridges, Average daily traffic volume data is provided to MDOT bridge owners by the Transportation Planning Section. Local agency route information may be obtained from a local planning commission or consultant. These values should be periodically updated and used to accurately code SI&A Item 29 and 115 in MiB[RIDG]E.

4.11 Electronic Bridge Files

All bridge file information can be stored as a hard copy or in electronic format. The files must be readily available for review to respond to unplanned events and for regularly scheduled inspections. The Bridge Owner will determine the best method for storing the required minimum information. A bridge file will contain a vast number of different types of documents and it is recommended that an organized electronic file be maintained for this information.

MDOT has developed a method for Bridge Owners to store electronic information in the MiB[RIDG]E web application and bridge database. The information has been separated into two primary types of electronic files; photos and documents may be uploaded using the Document tab for each individual structure. All files must be reduced to 30 megabytes or less prior to saving in the application. Common types of photo files, portable document format (PDF), and MS Excel spreadsheets are supported.

National Bridge Inspection Program (NBIP) reviews conducted by FHWA have identified several documents that are often missing or have been misplaced from the bridge file. The lacking information has triggered MDOT to provide FHWA with multiple corrective action plans concerning documents that are required to be in each bridge file. To resolve this deficiency each bridge owner will be required to be upload the following documents within 180 days of completing the routine inspection:

- Waterway Data for Each Structure Crossing Water
    - Scour Evaluation showing Coding of Item 113 (one of the following)
        - Level 1 Scour Assessment
        - Level 2 Scour Assessment
        - Scour Depth Calculations
    - Stream Bed Cross-Sections
- Highlighted Drawings of Fracture Critical Members (FCMs) for Non-Redundant Structures
    - Framing Plan with each FCM highlighted
- Inspection Procedures
    - If Routine Inspection Procedures Vary from MiSIM Chapter 5
    - Fracture Critical Inspection Procedures for Each Non-Redundant Structure
    - Underwater Inspection Procedures for Each Structure Requiring a Diving Inspection
    - Complex Bridge Inspection Procedures for all Movable and Unique Bridges